

SEQUENCE LISTING

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<120> PROTEIN

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<150> PCT/GB99/03631

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<150> GB 9823975.9

<151> 1998-11-02

<160> 26

<170> PatentIn Ver. 2.1

<210> 1

<211> 23

<212> PRT

<213> Streptococcus pyogenes

<400> 1

Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
1 5 10 15

Thr Asn Cys

<210> 2

<211> 58

<212> PRT

<213> Streptococcus pyogenes

<400> 2

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys

35

40

45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser
50 55

<210> 3

<211> 28

<212> PRT

<213> Streptococcus pyogenes

<400> 3

Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser
1 5 10 15

Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala Ala
20 25

<210> 4

<211> 184

<212> PRT

<213> Streptococcus pyogenes

<400> 4

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
50 55 60

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
65 70 75 80

Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
85 90 95

Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
100 105 110

Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
130 135 140

Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro Phe
145 150 155 160

Phe Thr Ala Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu Val
165 170 175

Val Ser Ser Lys Cys Lys Glu Asn
180

<210> 5

<211> 141

<212> PRT

<213> Streptococcus pyogenes

<400> 5

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
50 55 60

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
65 70 75 80

Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
85 90 95

Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
100 105 110

Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
130 135 140

<210> 6
 <211> 159
 <212> PRT
 <213> Streptococcus pyogenes

<400> 6
 Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
 1 5 10 15
 Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
 20 25 30
 Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
 35 40 45
 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
 50 55 60
 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
 65 70 75 80
 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
 85 90 95
 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
 100 105 110
 Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
 115 120 125
 Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
 130 135 140
 Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
 145 150 155

<210> 7
 <211> 217
 <212> PRT
 <213> Streptococcus pyogenes

<400> 7
 Met Gly Lys Glu Ile Lys Val Lys Cys Phe Leu Arg Arg Ser Ala Phe
 1 5 10 15
 Gly Leu Val Ala Val Ser Ala Ser Val Leu Val Gly Ser Thr Val Ser
 20 25 30

Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly
 35 40 45

Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg
 50 55 60

Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp
 65 70 75 80

Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu
 85 90 95

Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val
 100 105 110

Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp
 115 120 125

Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp
 130 135 140

Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu
 145 150 155 160

Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu
 165 170 175

Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
 180 185 190

Phe Phe Thr Ala Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu
 195 200 205

Val Val Ser Ser Lys Cys Lys Glu Asn
 210 215

<210> 8

<211> 259

<212> PRT

<213> Streptococcus pyogenes

<400> 8

Ser Ala Phe Gly Leu Val Ala Val Ser Ala Ser Val Leu Val Gly Ser
 1 5 10 15

Thr Val Ser Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro

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Asn	Gly	Gly	Thr	Leu	Thr	Asn	Leu	Leu	Gly	Asn	Ala	Pro	Glu	Lys	Leu	
35					40					45						
Ala	Leu	Arg	Asn	Glu	Glu	Arg	Ala	Ile	Asp	Glu	Leu	Lys	Lys	Gln	Ala	
50					55					60						
Ile	Glu	Asp	Lys	Glu	Ala	Thr	Thr	Ala	Ile	Glu	Ala	Ala	Ser	Ser	Asp	
65					70					75					80	
Ala	Leu	Glu	Ala	Leu	Ala	Asp	Gln	Ala	Asp	Ala	Leu	Gln	Ser	Glu	Glu	
85					90					95						
Ala	Ala	Val	Val	Gln	Ser	Asp	Asn	Ala	Ala	Ser	Asp	Ala	Leu	Glu	Ala	
100					105					110						
Leu	Ala	Asp	Gln	Thr	Asp	Ala	Leu	Gln	Ser	Glu	Glu	Ala	Ala	Val	Val	
115					120					125						
Lys	Ala	Asp	Asn	Ala	Ala	Ser	Asp	Thr	Leu	Glu	Ala	Leu	Ala	Asp	Gln	
130					135					140						
Thr	Asp	Ala	Leu	Gln	Ser	Glu	Glu	Ala	Ala	Val	Val	Lys	Ala	Asp	Asn	
145					150					155					160	
Ala	Ala	Ser	Asp	Thr	Leu	Glu	Ala	Leu	Ala	Asp	Gln	Thr	Asp	Ala	Leu	
165					170					175						
Gln	Ser	Glu	Glu	Ala	Ala	Val	Val	Lys	Ala	Asp	Asn	Ala	Ala	Ser	Asp	
180					185					190						
Thr	Leu	Glu	Ala	Leu	Ala	Asp	Gln	Thr	Asp	Ala	Leu	Gln	Ser	Glu	Glu	
195					200					205						
Ala	Glu	Val	Val	Gln	Ser	Asp	Asn	Ala	Ala	Ser	Asp	Ala	Trp	Gly	Lys	
210					215					220						
Ala	Ala	Thr	Pro	Ile	Ala	Leu	Asp	Val	Lys	Lys	Thr	Lys	Asp	Thr	Lys	
225					230					235					240	
Pro	Val	Val	Lys	Lys	Glu	Glu	Arg	Gln	Asn	Val	Asn	Thr	Leu	Pro	Thr	
245					250					255						
Thr	Gly	Glu														

<210> 9
 <211> 155
 <212> PRT
 <213> Streptococcus pyogenes

<400> 9
 Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
 1 5 10 15
 Ile Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu
 20 25 30
 Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu
 35 40 45
 Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu
 50 55 60
 Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys
 65 70 75 80
 Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
 85 90 95
 Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala
 100 105 110
 Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val
 115 120 125
 Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
 130 135 140
 Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
 145 150 155

<210> 10
 <211> 271
 <212> PRT
 <213> Streptococcus pyogenes

<400> 10
 Val Ser Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn
 1 5 10 15
 Gly Gly Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala
 20 25 30

Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile
35 40 45

Glu Asp Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala
50 55 60

Leu Glu Ala Leu Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala
65 70 75 80

Ala Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
85 90 95

Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Gln
100 105 110

Ser Asp Asn Ala Ala Gly Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
115 120 125

Asp Ala Leu Gln Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala
130 135 140

Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln
145 150 155 160

Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala
165 170 175

Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala
180 185 190

Ala Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
195 200 205

Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln
210 215 220

Ser Asp Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile
225 230 235 240

Ala Leu Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
245 250 255

Glu Glu Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
260 265 270

<210> 11

<211> 167
 <212> PRT
 <213> Streptococcus pyogenes

<400> 11
 Ala Ser Val Leu Val Gly Ser Thr Val Ser Ala Val Asp Ser Pro Ile
 1 5 10 15

 Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu Thr Asn Leu Leu
 20 25 30

 Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile
 35 40 45

 Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu Ala Thr Thr Ala
 50 55 60

 Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
 65 70 75 80

 Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala
 85 90 95

 Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln
 100 105 110

 Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala
 115 120 125

 Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val Lys Lys Thr Lys
 130 135 140

 Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln Asn Val Asn Thr
 145 150 155 160

 Leu Pro Thr Thr Gly Glu Glu
 165

<210> 12
 <211> 654
 <212> DNA
 <213> Streptococcus pyogenes

<400> 12
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 gtgtcagcat cagtattagt cggttcaaca gtatctgctg ttgactcacc tatcgaacag 120
 cctcgaatta ttccaaatgg cggaacctta actaatcttc ttggcaatgc tccagaaaaa 180

ctggcattac gtaatgaaga aagagccatt gatgaattaa aaaaacaagc tattgaggat 240
aaagaagcta cgacagctat agaagcagca agttcagatg ccttagaagc attagcggat 300
caaacagacg ctttacaatc agaagaagct gcggttggtta aagcggataa cgctgctagt 360
gacgccttag aagcattggc ggatcaaaca gacgctttac aatcagaaga agctgaagta 420
gttcaatcag ataacgctgc tagtgacgcc tgggaaaaag cagcaactcc aatcgcttta 480
gatgttaaga aaactaaaga taaaaaacct gtagttaaaa aagaagaaaag aaaaaacggt 540
aatacccttc ctacaactgg tgaagagtct aaccattctt ttacagctgc tgcgcttgca 600
ataatggtta gtacaggtgt gttagttgta agttcaaagt gcaaagaaaa ttag 654

<210> 13

<211> 777

<212> DNA

<213> Streptococcus pyogenes

<400> 13

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gttgactcac ctatcgaaca gcctcgaatt attccaaatg gcggaacctt aactaatctt 120
cttggaatg ctccagaaaa actggcatta cgtaatgaag aaagggccat tgatgaatta 180
aaaaaacaag ctattgagga taaagaagct acgacagcta tagaagcagc aagttcagat 240
gccttagaag cattagcggg tcaagcagac gctttacaat cagaagaagc tgcagtagtt 300
caatcagata acgctgctag tgacgcctta gaagcattgg cggatcaaac agacgcttta 360
caatcagaag aagctgcggt tgttaaagcg gataacgctg ctagtgacac tttagaagca 420
ttggcggatc aaacagacgc tttacaatca gaagaagctg cggttggttaa agcggataac 480
gctgctagt acactttaga agcattggcg gatcaaacag acgctttaca atcagaagaa 540
gctgcggttg ttaaagcgga taacgctgct agtgacactt tagaagcatt ggcggatcaa 600
acagacgctt tacaatcaga agaagctgaa gtagttcaat cagataacgc tgctagtgc 660
gcctggggaa aagcagcaac tccaatcgct ttagatgtta agaaaactaa agatacaaaa 720
cctgtagtta aaaaagaaga aagacaaaac gttaataccc ttcctacaac tggtgaa 777

<210> 14

<211> 469

<212> DNA

<213> Streptococcus pyogenes

<400> 14

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ggcaatgctc cagaaaaact ggcattacgt aatgaagaaa gagccattga tgaattaaaa 120
aaacaagcta ttgaggataa ggaagctacg acagctatag aagcagcaag ttcagatgcc 180
ttagaagcat tagcggatca aacagacgct ttacaatcag aagaagctgc gggttgtaaa 240
gcggataacg ctgctagtga cgccttagaa gcattggcgg atcaaacaga cgctttacaa 300
tcagaagaag ctgaagtagt tcaatcagat aacgctgcta gtgacgcctg ggaaaaagca 360
gcaactccaa tcgctttaga tgttaagaaa actaaagata caaaacctgt agttaaaaaa 420
gaagaaagac aaacggttaa tacccttcct acaactggtg aagagtaac 469

<210> 15

<211> 853
 <212> DNA
 <213> Streptococcus pyogenes

<400> 15
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 gaacagcctc gaattattcc aaatggcggg accttaacta atcttcttgg caatgctcca 120
 gaaaaactgg cattacgtaa tgaagaaaga gccattgatg aattaaaaaa acaagctatt 180
 gaggataaag aagctacgac agctatagaa gcagcaagtt cagatgcctt agaagcatta 240
 gcggatcaag cagacgcttt acaatcagaa gaagctgcag tagttcaatc agataacgct 300
 gctagtgcag ccttagaagc attagcggat caagcagacg ctttacaatc agaagaagct 360
 gcagtagttc aatcagataa cgctgctggt gacgccttag aagcattggc ggatcaaaca 420
 gacgctttac aatcagaaga agcttcggtt gttaaagcgg ataacgctgc tagtgacgcc 480
 ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagcttc ggttggttaa 540
 gcggataacg ctgctagtga cgccttagaa gcattggcgg atcaaacaga cgctttacaa 600
 tcagaagaag ctgcggttgt taaagcggat aacgctgcta gtgacgcctt agaagcattg 660
 gcggatcaaa cagacgcttt acaatcagaa gaagctgaag tagttcaatc agataacgct 720
 gctagtgcag cctgggaaaa agcagcaact ccaatcgctt tagatgttaa gaaaactaaa 780
 gatacaaaac ctgtagttaa aaaagaagaa agacaaaacg ttaataccct tcctacaact 840
 ggtgaagagt aac 853

<210> 16
 <211> 504
 <212> DNA
 <213> Streptococcus pyogenes

<400> 16
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 attattccaa atggcgggaa ctttaactaat cttcttggca atgctccaga aaaactggca 120
 ttacgtaatg aagaaaagagc cattgatgaa ttaaaaaaac aagctattga ggataaagaa 180
 gctacgacag ctatagaagc agcaagttca gatgccttag aagcattagc ggatcaaaca 240
 gacgctttac aatcagaaga agctgcggtt gttaaagcgg ataacgctgc tagtgacgcc 300
 ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagctga agtagttcaa 360
 tcagataacg ctgctagtga cgcctgggaa aaagcagcaa ctccaatcgc tttagatggt 420
 aagaaaacta aagatacaaa acctgtagtt aaaaaagaag aaagacaaaa cgttaatacc 480
 cttcctacaa ctggtgaaga gtaa 504

<210> 17
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 17

agcttttgga ttagttgcgg tgtc

24

<210> 18

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 18

agcttttgga ttagttgcgg tgtcagc

27

<210> 19

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 19

ttgactcacc tatcgaacag cctcg

25

<210> 20

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 20

aaaacctgta gttaaaaaag aagaaagaca aa

32

<210> 21

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 21

ccttcctaca actggtgaag ag

22

<210> 22

<211> 19

<212> PRT

<213> Streptococcus pyogenes

<400> 22

Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
1 5 10 15

Thr Asn Cys

<210> 23

<211> 25

<212> PRT

<213> Streptococcus pyogenes

<400> 23

Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys
1 5 10 15

Lys Gln Ala Ile Glu Asp Lys Glu Cys
20 25

<210> 24

<211> 19

<212> PRT

<213> Streptococcus pyogenes

<400> 24

Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys
1 5 10 15

Lys Gln Cys

<210> 25

<211> 18

<212> PRT

<213> Streptococcus pyogenes

<400> 25

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
1 5 10 15

Glu Cys

<210> 26

<211> 20

<212> PRT

<213> Streptococcus pyogenes

<400> 26

Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
1 5 10 15

Asn Val Asn Cys
20